Rapid and Real-time Sensitive Recognition of R/S-mandelic acid by S-MA Derivative-Modified QCM Sensor Based on Stirring

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This study presents a new approach for the rapid and real-time highly selective molecular recognition of chiral R/S-mandelic acid (MA) using a quartz crystal microbalance(QCM) modified with an amide-type S-MA derivative. A chiral discrimination factor of up to 21.0 between S-MA and R-MA on the S-MA derivative modified QCM sensor was obtained in the aqueous phase. Moreover, the interaction properties between the enantiomers and the chiral selector are studied in detail using an F-R model with different concentrations, and the results confirmed using a different QCM technique based on the alterations between unstirred and stirred conditions. The results implies the chiral recognition technique using the S-MA derivative QCM sensor under stirring conditions can become a new chiral separation technique.